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The páramo endemic *Aragoa* is the sister genus of *Plantago* (*Plantaginaceae*; *Lamiales*): evidence from plastid *rbcL* and nuclear ribosomal ITS sequence data

M. A. Bello[1], M. W. Chase[2], R. G. Olmstead[3], N. Rønsted[4] & D. Albach [2,5]

Summary. *Aragoa* is a genus endemic to the páramos of Colombia and Venezuela. The systematic position of the genus has been controversial because of its peculiar morphological features, although many authors have placed it in *Scrophulariaceae*. Because of this and the fact that the delimitation of *Scrophulariaceae* and allied families has recently changed, a molecular analysis is used here to investigate the phylogenetic position of the genus. Both *rbcL* and ITS sequences show that *Aragoa* is sister to *Plantago*, in a clade including also *Veronica*, *Hemiphragma* and *Digitalis*. These results put in doubt previous hypotheses about the biogeography of this páramo genus and indicate that more phylogenetic analyses are necessary to study the history of the páramo biota.

Introduction

Páramo is a high-Andean ecosystem found between 2,800 to 4,700 m elevation, restricted to the northern Andes: Colombia, Venezuela, Ecuador and northern Perú, as well as a few places in Costa Rica (Cuatrecasas 1979, Cleef & Chaverri 1992). With a continental, island-like distribution, it ranges discontinuously between 11°N and 8°S, occupying no more than 2% of the northern Andes. Páramos are biologically diverse, containing more than 300 genera of vascular plants, 8% of which are found nowhere else in the world (Cleef 1979, Luteyn 1999). The páramo has a geological history of approximately five million years (van der Hammen 1961, Simpson 1971, Baumann 1988). The present climate is characterised by daily extremes, from warm days to freezing temperatures at night (Cuatrecasas 1934, Schnetter *et al.* 1976). Consequently, vascular plants display particular morphological (e.g., many rosette and caespitose plants), anatomical (e.g., xeromorphy) and physiological (e.g., low root water-absorption) features (Goebel 1975, Cuatrecasas 1968). Afroalpine vegetation displays striking similarities to the páramos, but the extent of diversification is different in these two ecosystems (see Hedberg 1992 for a detailed comparison).

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[1] Instituto de Ciencias Naturales, Universidad Nacional de Colombia, AA. 7495, Bogota, Colombia.
[2] Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3DS, U.K.
[3] Department of Botany, University of Washington, Seattle, Washington 98195-5325, U.S.A.
[4] Department of Medicinal Chemistry, Royal Danish School of Pharmacy, Universitetsparken 2, Copenhagen 2100, Denmark.
[5] Botanisches Institut der Universität Wien, Rennweg 14, 1030 Austria.